PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 00404-02	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US00/16135	International filing date *(day/month/year)* 12 June 2000 (12.06.2000)	Priority date *(day/month/year)* 12 June 1999 (12.06.1999)
International Patent Classification (IPC) or national classification and IPC IPC(7): C07K 14/71, 14/60; C12N 15/18; A61K 38/25 and US Cl.: 512/2, 12; 530/300, 324, 350; 536/23.1, 23.5, 23.51		
Applicant UNIVERSITY OF VIRGINIA PATENT FOUNDATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
09 January 2001 (09.01.2001)	10 September 2001 (10.09.2001)
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Claire M. Kaufman Telephone No. (073)308-1096

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International appl[redacted] No.
PCT/US00/16135

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed.

☒ the description:
pages 1-15 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the claims:
pages 16 and 17, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the drawings:
pages 1-3, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the sequence listing part of the description:
pages 1-5, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☒ contained in the international application in printed form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages NONE

☒ the claims, Nos. NONE

☒ the drawings, sheets/~~fig~~ NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

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III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The question whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application,

☒ claims Nos. 8,15,17 and 18

because:

☐ the said international application, or the said claim Nos. ____ relate to the following subject matter which does not require international preliminary examination *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. ____ are so unclear that no meaningful opinion could be formed *(specify)*:

☒ the claims, or said claims Nos. 8 and 15 are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 8,15,17 and 18

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

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V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 2, 4, 9-13, 16	YES
	Claims 1, 3, 5-7, 14	NO
Inventive Step (IS)	Claims 2, 4, 9-13, 16	YES
	Claims 1, 3, 5-7, 14	NO
Industrial Applicability (IA)	Claims 1-7, 9-14, 16	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS

Claims 1, 3 and 14 lack novelty under PCT Article 33(2) as being anticipated by WO 98/32857.
WO 98/32857 teaches a human GHRH (a.k.a. GRF, page 11, lines 25-29) which comprises a biologically active fragment of SEQ ID NO:2 of the instant application, and which, according to the instant description (page 14, lines 15-27), binds to the chicken GHRH (cGHRH) receptor of SEQ ID NO:4. One would reasonably expect absent evidence to the contrary, that such binding would lead to stimulation of second messenger signaling at the cGHRH receptor.

Claims 1, 3, 5-7 and 14 lack novelty under PCT Article 33(2) as being anticipated by PORTER ET AL. or MCRORY ET AL.
PORTER ET AL. teach human GHRH (hGHRH) that stimulated GH release in chick pituitary cells (page 1852, second paragraph of column 2).
MCRORY ET AL. teach hGHRH (GRF) that stimulated GH release in chick pituitary cells (page 95, beginning of second paragraph of column 2).
In view of the GH release reported, hGHRH is necessarily a ligand which stimulates second messenger signaling at the cGHRH receptor.
Also, the chick pituitary cells necessarily contain a chicken GHRH receptor, and that receptor would reasonably be expected to comprise that amino acid sequence as set forth SEQ ID NO:4 and 5 absent evidence to the contrary. Note that the claimed receptor is not required to be isolated.

Claims 2, 4, 9-13 and 16 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a polypeptide comprising the amino acid sequence of SEQ ID NO:2, particularly with Lys21, an encoding nucleic acid, a nucleic acid encoding a chicken GHRH receptor, or methods of using the GHRH as claimed.
Claims 1-7, 9-14 and 16 meet the criteria set out in PCT Article 33(4) because they have industrial applicability.

---------- NEW CITATIONS ----------
NONE

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claim 7 is objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: there is no SEQ ID NO: after the second occurrence of "NO:".

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claim 3 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim is indefinite for the following reason(s): it is unclear what constitutes a "biologically active fragment". There is no limiting definition of "biologically active".

Claims 1-7, 14 and 16 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim is indefinite for the following reason(s): because the polypeptide(s) and nucleic acid(s) are not claimed as "isolated" and, therefore, it is not clear if they are intended to be claimed as including unisolated products or as showing the hand of man.

Claims 1 and 14 are not fully supported by the description as filed because they are drawn to a ligand that binds the GHRH receptor of SEQ ID NO:4 but provide not limitation relating to the structure of the ligand. Therefore, they are single means claims, claiming the product not by what it is, but by what it does.